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GROWING PECANS

UNDER WESTERN CONDITIONS



The Evans Specialty Nursery
Arlington, Texas

Foreword

To those interested in pecan culture, particularly those in the great native pecan belt, this booklet should be of interest and profit. More than twenty years of study devoted to the subject in the west have enabled us to present it for your consideration.

We assure the reader that it contains not a single exaggerated statement, to the best of our knowledge and belief.

We feel justified in the opinion that our long experience, observation, study and extensive travel and experimental work have made it possible for us to render a service in connection with pecan growing; and with this end in view, we will gladly answer all questions directed to us concerning the subject, so far as we can, whether from a customer or not.

Our Policy

There is great interest in pecan culture at this time, and that interest is constantly growing; but the business is a new one, and the public has come into possession of little sound information and much misinformation about it.

All branches of the nursery business are specialized, and the pecan branch perhaps more than any other, and by the very nature of the case the nurseryman should know more about the business than his customer. We, therefore, recognize more than a common obligation resting upon us to render the customer a real service in the purchase of trees. So we have adopted the policy of trying in every case to find out all we can about the texture and depth of his top soil, the character of his subsoil, slope and drainage of his land, the annual rainfall, and all other factors that modify varietal selection.

We have advised many prospective customers not to set out pecan trees at all after examination of their lands had disclosed the fact that they were not adapted to the purpose. Also we never sell a customer a variety of tree that we think would not do well where it is to be set without first advising him of our opinion about the matter and asking for further instruction.

Many nurserymen hold these things to be none of the business of the nurseryman but altogether that of the owner of the land. We do not look at it in this light. We feel it a duty we owe to those who purchase from us to help them in every possible way we can. So here is our pledge:

We will not without first advising to the contrary sell either any plant to anyone to be set in soil unfavorable to its growth or any variety of plant we would not select to grow for ourselves under like conditions.

A highjacker is a Christian gentleman in comparison with a nurseryman who would knowingly sell either pecan trees to be set in land not adapted to pecan growing or varieties of pecan trees not adapted to the environment where they are to be grown, for the highjacker violates no trust, and would rob once for all and get all, whereas the nurseryman would get only some 10 per cent profit out of the first robbery and would lead the customer to spend ten times the first loss during the next ten years, to reap only disappointment at last. Abstract right is, of course, above all questions of expediency. But even on the ground of expediency we neither want to see pecan trees set in land not good for the purpose nor varieties of pecan trees set under climatic conditions to which they are not adapted, as such ill-advised undertakings lead to failures, and failures tend to retard the development of the industry, and thus eventually hurt the nursery business.

You Are Invited to Visit Us

If you are thinking of setting out a pecan orchard it will pay you to visit our nursery, three miles from Arlington, on the Mansfield pike. We can tell you a great deal more in a short time here with the trees before you than we could write you in many letters. Here you can also select your varieties with bearing trees of the same kind before you.

Arlington is on a main artery of travel, and any time you may happen to be passing through this part of the country, a phone call put in at either Fort Worth or Dallas for 9022 at Arlington will enable us to meet you at Arlington and bring you out to the nursery without delay.

Our Warrant

We warrant all our trees to be of mature hard wood, not spongy from over-stimulation; to have thick, tough bark for some distance above ground, so as to better resist sun-scald; to be dug with tap roots whole in most cases, and where not whole, to be cut not less than four to five feet below the surface of the ground, where the root is small; to leave the nursery well packed, not having the roots dry after digging; to be true to variety ordered.

In connection with the last item, we are very careful not to get our varieties mixed. Then, too, the varieties differ each from the other to such an extent as to make them easily distinguishable.

Mistakes are, therefore, not likely to occur. Should one happen, however, the customer may keep the tree sent by mistake and we will send him another tree of the variety ordered, but we will not be further liable.

Substitution

We reserve no right to make substitutions when we are out of the varieties ordered. We are glad at any time to advise our customers in the selection of varieties, but their final choice is entirely their own business.

Our Terms

Cash with orders for immediate shipment.

It is not only expensive to grow pecan trees, it is also very expensive to dig them with long tap roots as we do, and our expenses are very heavy during digging and packing season.

We pay cash for everything we buy and it is necessary for us to require cash from our customers.

Customers who want trees selected, dug, and held for shipment on some future date, should remit 25 per cent of the amount of the order at the time reservation is made. The remainder must be paid when shipment is ordered.

Our Location

A line drawn along the general course of the Eastern coast of Mexico and extending through Texas passes through Arlington.

The prevailing winds here are from the south, and it used to be said that all territory east of this line was agricultural and all west of it grazing, because it was thought that the south winds from over the waters of the Gulf would bring rain, while those that came across the land of Mexico would be dry. This reasoning was, of course, too rigid to adapt itself to the varying factors that modify climate. Much of the most valuable agricultural area in Texas lies West of this line.

Still, that this reasoning embraces some elements of truth is shown by the fact that each succeeding county west of this line has a lesser average annual rainfall than the one immediately east of it.

The natural home of the pecan, where there are tens of millions of trees

growing in the wild, lies along this line, principally on its western side.

The great diversity of soils and subsoils in this locality enables one to find here almost any character of land that could be found elsewhere on the continent.

Our nursery is located on the timber side of the border line between the great prairie and the eastern cross timbers. Our stock is grown in sandy flats underlain by a sweet red clay subsoil where the water table is from six to nine feet down.

A fine combination, we think you will agree, for the great purpose we have undertaken.

Under the head of "Varieties", you will find a brief description of the differences between the eastern and western kinds of pecans, and it was not by chance that our nursery is located on the line where either kind can be grown successfully.

We are in immediate connection with more than a thousand miles of paved highway, and a radius of thirty miles would, taking our nursery as a center, describe a circle containing 700,000 people.

Arlington is situated midway between Fort Worth and Dallas, not very far from either. It has not only train connections with both cities, but also hourly interurban service and numerous freight lines which, together with our own truck service, places us in connection with twenty lines of railway radiating in every direction, most of them trunk lines—and these facilities both cut down the time trees are in transit and make transportation charges less than they would be were our nursery located in some out-of-the-way place from which trees would have to be first sent to some central railroad point before they could really be started on their journey. Perhaps there is not another place, taking all things into consideration, so well adapted to the purpose of our work as is the one we have chosen.

Pecan Culture and Its Future

The pecan is a species of nut bearing tree native to America, and is beyond doubt the most important nut bearing tree in the world.

We think it probable that its place of origin was on the upper reaches of some of the rivers of Texas, from whence it spread west and south into Mexico and even to some extent into some of the Central American countries; and east into Louisiana and Mississippi and even a few trees into western Alabama; and northwest (perhaps by Indians) as far as Kentucky and southern Illinois.

What the factors were that limited its further eastern spread, perhaps no one could say with positive assurance. We think it was the prevalence of fungous diseases, which are favored by a damp and humid climate.

It is often stated that because a plant is not indigenous to a particular territory is no proof that it will not thrive there. And to support this statement such instances are cited as the growth of the Bermuda onion in Texas.

We acknowledge the truth of the statement within its proper limits. But a considerable stretch of ocean intervenes between the native home of the Bermuda onion and Texas, and it is not likely that an onion seed would ever have found its way to Texas soil without human instrumentality.

Where no insuperable barriers, such as expanses of water or high mountains occur between sections, and still there is a limitation to the spread of a particular plant life from one section to the other, the cause of that limitation must be sought in changes of environment that are in some way inimical to the particular plant. And under these conditions when a plant is taken from the section to which it is indigenous, and is transplanted to the other section, it may continue to thrive for a time, but it is more than likely that the causes that operated to limit its spread in the first place will eventually re-assert themselves.

There are no physical barriers to prevent the spread of the pecan from its native home in the West to more eastern parts of the United States. There are rivers between the two sections, but rivers serve both to carry the nuts

from one bank to the other and furnish moisture for their germination. So rivers are an aid and not a barrier to the spread of the pecan.

Pecan trees in the greater portion of the native pecan belt of Texas and Oklahoma are practically free from fungous attack, and those who engage in the industry there are not under necessity of constant spraying in effort to control those diseases, which spraying is a source of much trouble and expense. Also some varieties of pecans are more resistant to fungous attack than others, and the Gulf Coast belt is limited in its choice of varieties to the few that are most resistant, whereas the native pecan belt has an unlimited range of choice.

There are millions of pecan trees growing wild here, each different from all the others, each one a variety within itself, and all growing free from attacks of scab, for instance. How many of them would continue to grow that way further east, along the coastal belt?

The most favorable location for pecan culture is, we think, along and proximate to the line of thirty-inch rainfall, beginning some distance from the Gulf and extending through Texas into Oklahoma.

We, therefore, think that the greatest pecan development will take place in the native pecan belt of the west, where a dry atmosphere brings practical immunity from fungous diseases.

The lines along which the pecan industry will ultimately develop in respect to marketing the product (and with that the relative influence the marketing end will have on the choice of varieties) are not yet perfectly clear, but we expect them to run largely to marketing the finished product.

There will doubtless be packing plants in many towns that are located in good pecan-producing territory, and pecan products will be found on the shelves of the leading grocery stores throughout the land. The housewife just will not—cannot—sit down and pick out pecan kernels every morning to make school lunches for the children, though she would be glad to use such a palatable and healthful product if it were available to her in usable form.

In this connection we call attention to the fact that large size in a pecan is not a factor of actual value.

Up to the present time almost every one who set out pecan trees was largely influenced in his varietal selections by the size of the nuts he expected his trees to produce. But the time will soon come when discriminating taste will take into consideration other points of greater value, such as thinness of shell, ease of cracking and separation, freedom from dust and corky packing, and richness and flavor of kernel.

The attractive appearance of nuts of large size may lead to their purchase in small quantities, but acreage of large varieties is already extensive and the market is more or less limited.

A ready market for car lots is just as necessary to the pecan industry as is such a market for cotton, cattle or any other product.

We present here two letters from the G. A. Duerler Mfg. Company, perhaps the biggest purchaser of pecans in the world, and certainly the oldest one.

The first of these letters was in response to questions by us about the kind of pecans in greatest demand for general purposes. After the receipt of the letter, we sent them nuts of one of our varieties for their judgment about it, and the second letter states their opinion.

Evans Specialty Nursery,
Arlington, Texas.

San Antonio, Texas, October 18, 1927.

Attention: Mr. J. A. Evans.

Dear Sir:

Your letter October 17th, regarding size of pecans best suited for the confectioners' trade:

Our experience which extends throughout the United States shows that for topping purposes, halves which will count 600 to 700 to the pound are the most desirable. It is our opinion, however, that the bulk of pecans for use in the confectionery trade are not used for topping purposes, but are used in other manners, such as salting, etc. The largest customers we have are those who buy pecans for salting purposes and they invariably demand a pecan which will count from 400 to 500 halves to the pound.

We are not certain, but it is our opinion that pecans in the shell of uniform size which will count about 90 to the pound would produce halves counting around 400 to 500. We are also of the opinion that perhaps 50 per cent of the pecan halves sold in the United

States are graded so as to run suitable for salting purposes as outlined above.

Of course, as pecans are gradually improved in size and quality, these standards may change, but it appears to us that the larger pecans grow, the less quality is found. We therefore believe that, summing up the situation as a whole, a pecan which would be of uniform size, thin shell and count about 90 to the pound would be an ideal grade for shelling purposes, and would be accepted almost uniformly by the confectionery trade as a whole as the standard buy.

Very truly yours,

G. A. DUERLER MFG. CO.,
(Signed) By M. L. Taylor, Sales Dep't.

Evans Specialty Nursery,
Arlington, Texas.

San Antonio, Texas, November 30, 1927.

Attention: Mr. J. A. Evans.

Dear Sir:

We have carefully examined the sample of Nugget pecans referred to in your letter of November 29th.

We want to say in all sincerity that your Nugget pecan comes nearer meeting our ideas covering a standard pecan for all purposes than any pecan we have ever seen.

While a casual observation of the Nugget pecan leads one to believe that it is somewhat small, yet the shell is so extremely thin that the halves produced from these pecans are actually much larger than you would expect them to be. The flavor is excellent. In other words, we consider the Nugget pecan ideal, not only from a shelling standpoint, but from a point of largest probable consumption.

Very truly yours,

G. A. DUERLER MFG. CO.,
(Signed) By M. L. Taylor, Sales Dep't.

The particular pecan referred to in this letter is the Nugget, which runs about 80 to the pound. Every 100 pounds of these nuts turns out 63.4 pounds of kernel in halves, and there is perfect freedom from dust and corky filler.

Now let us analyze the market for this pecan:

If common pecans sell at 12c, and this particular pecan turns out twice as much meat as the common pecan, then certainly the cracking plants would be willing to pay 24c per pound for it on that basis alone.

The picking out of the kernels of the common run of pecans costs some 10c or 11c per pound, and the kernel of the Nugget can be picked out for one-third this cost.

Also kernels gotten out in halves sell for something like 10c per pound more than kernels gotten out in broken pieces. And since all the kernels of the Nugget pecan come out in halves a gain here should also be added to its price.

So we feel confident that any number of car lots of this particular nut would be taken at any time by any of the leading cracking plants at a price of some 30c to 33c per pound—and it would mean a great deal to the grower of pecans on a large scale to have a ready market for his whole crop rather than to go to the expense and trouble of marketing it in small packages to many customers all over the country.

When pecans run fewer than about 50 to the pound they begin to run into coarseness, and the medium sizes are of higher quality than the extremely large ones, and they also bear more prolifically.

If we were going to set out a thousand-acre orchard this season we would set fully one-half of it to the medium-size, high-grade nuts, adapted to both the cracking trade and general use, such as the Nugget.

We think the greatest development of pecan culture will take place by growing medium-size nuts of high quality, adapted to the general trade, together with some nuts of larger size to meet the demands of special occasions.

An acre of pecan trees in good bearing will produce more pounds of nuts than the same acre in cotton would produce pounds of seed cotton.

The pecans would bring 40c per pound—the cotton would bring—what?

It is estimated that an acre of good land cannot be depended upon even under good management to produce more than 150 pounds of dressed beef per year. The same acre in bearing pecan trees would produce from 1,000 to 2,000 pounds of pecans per annum, equivalent in food value to 4,000 to 8,000 pounds of beef, live weight.

But in order to accomplish these results it is necessary to have good pecan soil, to set out the proper varieties of trees for the particular location, and then to give the trees adequate cultural attention.

The pecan tree responds to such attention just as readily and fully as any other plant.

We would not lend countenance to exaggerated statements based upon some

PRICE LIST

Fall 1928 -- Spring 1929

Evans Specialty Nursery, Arlington, Texas

BASIS OF PRICES

Any correct conception of the value of a nursery pecan tree must take into consideration, (1) the diameter of the stem; (2) the height of the tree; (3) the root. In short, the value of the tree depends upon its general development and not upon any single feature of that development.

We have slim trees (mostly eastern varieties) in our nursery, ranging from six to eight feet in height, that we feel are only \$1.50 trees. We also have many other trees of no greater height, but with thick trunks, and well branched and headed, that are cheap at \$4.00.

Extra height in a tree is of no value. In fact it should be cut off before the tree is transplanted; and as the length is both a trouble and expense in shipping, the cutting should be done at the nursery. Not only that, but the nurseryman is supposed to know more about how a tree should be cut back than the customer does, who has given no special attention to the matter.

Pecan trees are usually classed as 3 to 4 foot trees, 4 to 5 foot trees, 5 to 6 foot trees, and so on. But this classification should carry with it other significance than height alone. It should carry diameter also (caliper), the two together better representing general development of the tree. It would be still better to have some standard of root development, if that were either in common use by nurserymen or could be made practical. But since neither seems to be the case, we can only say that our trees have a well developed root system, that the tap roots are dug whole in nearly every case, and practically whole in all.

The following table classifies our trees by feet, caliper, 6 inches above the bud, and price:

Trees by feet.....	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-10	Larger trees are
Caliper by inches.....	5-16	7-16	9-16	11-16	3-4	7-8	1	1 1/8 - 1/4	classified as
Price of trees.....	.90	1.25	1.50	1.75	2.00	2.25	2.50	3.50	yard trees.

We give a 10 per cent discount in lots of 100 and a 20 per cent discount in lots of 1,000. 10 per cent discount applies to 75 and up. 20 per cent discount applies to 750 and up.

These prices apply to western varieties, budded to western root stocks some distance above the ground and dug with whole tap roots in most cases, and practically whole in all.

The size of tree to buy depends upon what the customer wants after weighing early production against first cost. A larger and older tree will come into bearing sooner than a smaller and younger one, and will pay the difference in price back to the owner several times during the first ten years. Otherwise the smaller tree is just as good.

particular yield of some particular tree in some particularly favorable location, multiplied by a big number of trees per acre (some nurserymen recommend as many as 48 trees per acre). Such statements are altogether misleading, and are hurtful to the industry.

It is fortunate that 27 or more trees per acre will not each yield such crops as these statements indicate; for if they did, the industry would soon be ruined by overproduction. A pecan orchard will, however, under the conditions above indicated, pay as high rate of return upon its investment as any sound-minded business man would reasonably expect.

We have a nine-year-old tree here which at this time has a crop on it of fully 60 pounds of nuts. These nuts at 40c per pound would bring \$24.00, and with 12 such trees to the acre, the income from each acre would be \$288.00—and all based on actual existing evidence. But to present such a statement without modification would be to indulge in the exaggeration we have just condemned. So we state freely that this particular tree is the most heavily laden one on the place. Still we feel quite sure that the average of the trees of this age will produce fully one-half as many nuts as this particular tree, amounting in money to \$144.00 per acre.

Our general statement to the public is that a western pecan orchard, set in good pecan soil to begin with, and receiving proper cultural attention all along the line from the beginning, will at ten years of age bring an income of \$100 per acre.

We stand upon that statement, and are willing to meet you with it again in the future.

Pecan trees live a long time, and a pecan orchard is a permanent investment in so far as the life of a man is concerned, or even his children and children's children, and a ten-year-old orchard will continue to increase its production for many years to come. So we say that any permanent investment that continues to grow better from year to year is worth the amount it pays 10 per cent interest on at the time, or \$1,000 per acre—but we repeat that for an orchard to be worth that much it must embrace the three essentials previously enumerated.

Pecan culture in the dry climate of the native pecan belt offers one of the greatest opportunities of the time. It is true that there have been failures in attempts to establish pecan groves, but these failures grew out of lack of knowledge of the business, and they need not be repeated now.

We think there is no acre of walnut grove in California, or any other acre of nuts or fruit anywhere that is worth more than an acre of western varieties of pecans set out in good pecan soil and receiving proper cultural attention.

Climate, Soil and Subsoil

We are often asked whether or not to set certain kinds of land to pecan trees.

In order to answer this question, and also as to what varieties to use, it is necessary to know the location—or rather the climate as affected by the location. Both temperature and moisture have an important bearing on the problem. Some lands that might be profitably used in Louisiana or East Texas could not be profitably used here, and would be still less suited further west.

Beginning in the east and going to the west, the change in the adaptability of soils conforms to the necessary requirements for securing a sufficient supply of moisture.

The ideal condition for pecan trees is to have their roots in constant but moderate soil moisture and their tops in dry air and maximum sunlight.

The eastern division has plenty of moisture, even on the hills where the soil is thin; but it cannot have dry air and maximum sunlight, and the trees suffer from fungous diseases.

The western division has the dry air and plenty of sunshine and is practically free from fungous diseases, but cannot have a sufficient and dependable supply of moisture except by careful selection of soil.

The problem, therefore, is one of much greater importance in the great pecan belt of Texas and Oklahoma and places further west than it is in Eastern Texas and Louisiana and places further east.

The great natural pecan belt of Texas and Oklahoma affords the most ideal conditions for pecan culture to be found, but the percentage of land there that is highly adapted to the purpose is much below what the general public conceives.

In the eastern section almost any fairly fertile land of loose texture that is underlain by a porous clay subsoil will do for the purpose provided the water table is not too near the surface. The channels of the streams there are fairly shallow and do not drain the valleys to any considerable depth, and much land that would otherwise be the best is too wet for the purpose. In the western section the soil is very fertile and the atmospheric conditions are favorable, and the consideration there is one of a constant though moderate supply of moisture.

The best combination for securing and maintaining this moisture is a surface soil of loose texture underlain by a porous clay subsoil. The necessary depth of the surface soil varies with the rainfall and in no case should there be less than twelve to eighteen inches, and more would be better. A surface soil of loose texture, preferably one containing some sand, is important because it readily takes in the rainfall and also because it allows an easy development of an extended lateral root system.

The clay subsoil is important because it will catch and hold the water taken in through the loose soil above, and also because it will bring moisture up by capillary attraction.

In sand, water will rise some eighteen inches by capillary attraction. In silts it will rise from 7 to 9 feet. In the finest clays it will rise from 16 to 20 feet.

Many of the valley soils of the West are fine for pecans, being composed of eroded rock (sand), light clays and decomposed vegetable matter; and the very best of them are the ones that contain the most sand and have either clay subsoil or free water within reach of the roots—though the roots must not be in water but above it.

We do not consider heavy, black waxy land, either valley or prairie, that cracks badly, as first-class pecan land.

The opinion has been prevalent that pecans can be grown successfully in this section only in bottom land. Probably the opinion is based on the fact that the trees in the wild are largely confined to such locations. Space will not afford an explanation of this phenomena, but the opinion is an error. Many sandy uplands, particularly flats where the soil is deep enough and clay underlies, are admirably adapted to the purpose. Trees set in such locations may not grow quite as rapidly as others in bottoms, but they will begin bearing at a younger age.

There is a growing tendency toward the use of such land for pecan orchards—not to the exclusion of bottom land, but by way of extending the field.

The texture of a hard-natured top soil is hard to change to any extent, and the nature of the subsoil cannot be changed at all. For this reason the texture of the top soil and the character of the subsoil are of first importance.

It is easy to add fertility to sandy soil by raising leguminous crops and plowing them in, and also by the addition of other fertilizers. Sandy soils respond readily to such treatment.

Even blow sand can be made to answer the purpose admirably by plowing under a few crops of peas, provided the right kind of clay underlies the sand—which is usually the case.

Sand readily absorbs rainfall, especially when well tilled, and by the use of terraces to prevent run off of heavy rains, sufficient moisture can be conserved to supply the needs of the pecan orchard.

It is our idea that great development of pecan orchards will take place in sandy land.

We do not mean to convey the impression that sandy loam soils with clay subsoils are the only kinds that will grow good pecan trees. This type is of more extended area than other types adapted to successful pecan growing, and we had to select some type as a means of explaining the factors involved in the production of nuts.

Any other type of soil that meets the requirements set out in connection with sandy loam soils might, and perhaps would, do as well. For instance a silty soil some ten feet deep to permanent water table would be very fine for

growing pecan trees because silt is a fairly good capillary conductor of soil moisture, and the hair roots of the trees would receive a moderate but adequate supply of it without any intervening layer of clay subsoil.

Some say that any land that will grow good crops of cotton and corn will also grow good crops of pecans. This statement is an error.

Not all of such land or half of it, either, will grow good crops of pecans. A pecan tree must grow to live, and it is the margin left over after growing that can and may be turned into nuts for the profit of the owner.

A pecan tree growing in tight though fertile soil that is subject to extremes of moisture and drouth may, under peculiar conditions, including the previous season, produce a crop of nuts occasionally, but it cannot be depended upon to bear regularly. For, under the influence of spring rains, it puts on a heavy annual growth, and certainly cannot possibly develop that growth under the influence of extreme drouth later in the season. And the consequence is under-developed buds in the new growth, and no crop the following season.



FIG. 1.—Halbert. Typical Western

FIG. 2.—Stuart. Typical Eastern

Eastern and Western Varieties Of Pecans

There are such broad differences in the habits of growth and form of trees between the eastern and western varieties of pecans as to make it necessary to take these differences into account in arriving at a correct conception of the value of nursery stock of one kind or of the other. They are so different, in fact, that they can not be correctly judged by the same standard. The eastern kinds are of larger early growth than the western, and they have few branches putting out from the main stem. These branches are long and shanky like fishing poles, and, in turn, have few subdivisions. It is not uncommon for growth from a bud in the nursery row to attain a length of six or seven feet during a season without a single branch from the side. The appearance of such a tree is attractive to the eye, and the tree is likely to be pleasing to the customer if judged by appearance only.

However, the habit of sparse branching is much against a variety, as the buds that produce the clusters of nuts come in the ends of the branches—and the more branches, the more terminal buds—the more terminal buds, the more clusters—the more clusters, the more nuts.

It is physically impossible, other factors being equal, for a sparsely branched tree to produce as big a crop as a many-branched tree.

The western trees, as a rule, are of a more slender growth than the eastern ones, and they divide this growth into many branches. The stems of the nursery trees may not be as straight because, being slender, they are hard to keep from bending while growing. They are also likely to have knot scars on them where the lateral branches were cut either during the growing season or at the time of shipment.

But the stem will straighten, the knot scars will heal over, and the western tree with its numerous pendulous branches will eventually become more beautiful than the eastern one. Faith in this type of tree, notwithstanding its appearance, will be abundantly justified.

We have actually had complaints from customers that the trees they got from us were rough—did not have nice, smooth bark like some they had seen. (We pause for the moral that these are not the only instances where people have gotten something good for them and did not know it at the time.)

All pecan trees eventually have rough bark, and western trees have it much earlier than eastern.

Rough, corky bark is better protection to a tree in many ways than smooth, thin bark; so do not become dissatisfied if your trees from any western nursery come to you with thick bark of this kind.

Under the head of "Our Methods of Production," we quote the pecan specialist of the U. S. Department of Agriculture, Farmers' Bulletin No. 1501, pages six to eight, showing why corky bark is better than smooth.

Our Methods of Propagation

Improved pecan trees are propagated asexually by means of scions (buds or sections of small limbs with buds on them) taken from a tree of a desired kind and placed on another tree (called the stock) where they are made to unite and grow.

The result is accomplished by the employment of some one or more of the various systems of budding and grafting.

The pecan is perhaps the most difficult of all trees to propagate in this way, even more difficult than other members of its family, and the slender western varieties are the very most difficult of all.

In case of a mature tree, there is no difference in the value whether budded or grafted. Budded trees, however, possess certain advantages over grafted ones in point of getting them to live after transplanting. A big percentage of the trees set out in Texas have died from sun scald, a trouble caused by the extreme heat of the sun in mid-afternoon when its direct rays and the reflected ones from the ground converge upon the little tree upon its southwest side, burning it and killing the cambium cells, just as a small fire might do.

Now, grafting of nursery trees is done below the surface of the ground, and the growth from the graft has smooth, tender bark that, however pleasing it may be to the eye, is nevertheless much more subject to this injury than a thick bark would be—in fact, this injury does not occur where the bark is thick and corky.

Budding is done above ground at any desired height, leaving the thick bark of the stock to protect the tree against this injury, and also against any physical violence that might happen to it, such as gnawing by rabbits.

The following quotation is from Farmers' Bulletin No. 1501, pages 6-8, U. S. Department of Agriculture:



FIG. 3.—"Bark below and above a pecan union eight years after grafting, showing contrast. When pecan trees have been propagated near the ground the smooth bark is brought low, subjecting the tree to the danger of a form of trunk injury which seldom affects parts with rough scales." U. S. Department of Agriculture

"During the early life of pecan orchard trees, and under certain climatic conditions, there are often distinct advantages in favor of budded stock, particularly with reference to winter injury to trunks, which has been very noticeable with the pecan in the east, both south and north. For a period of four to eight years—depending somewhat upon the

variety, the bark of a tree above the point of union is likely to be smooth and largely without the natural protecting corky layer of the seedling stock below. Trunks on rapidly growing trees which have been propagated at the ground line or below and on which, therefore, this smooth bark extends almost to the ground are very subject to winter injury. This condition is particularly true on the southwest side of trees growing in the richer spots of sandy soil, and invariably occurs immediately above the ground. As this seldom happens with trees that have been worked a foot or more above ground, and as budded trees are usually worked at this height, whereas grafted trees are nearly always worked below the surface, the advantage in favor of the former method is apparent.

The superiority of budded pecan trees in this respect is regarded by many experienced planters as being so important that they refuse to buy grafted trees. Budded pecan trees are distinctively preferable . . . and should be obtained for planting except under special conditions. . . .

We propagate most of our trees by the **Skin Bud** method (suggested by skin grafting on the human body), invented, developed and introduced by our Mr. Evans.

It is said that necessity is the mother of invention, which is certainly true in this case. The western varieties with their delicate buds were found to be so difficult to propagate as to require something more successful than any of the methods heretofore employed in order to meet the enormously increasing demand for western trees.

Only a few of our trees are grafted (not one per cent) and all of them are done by our improved method of bark grafting, high enough above the ground to obviate all objections that arise from thin new bark near the surface of the soil.

"Easy to Live and Early to Bear"

This is our motto, and it is true—our trees are easy to live, to some extent because of the way they are grown, but more especially because of the way they are dug—with the whole tap root. They bear early because, to some extent, of the attention they have received, but more especially because of the inherent bearing qualities of the varieties, for which qualities we cannot claim credit, as we had nothing to do with that.

We have grown both eastern and western kinds, side by side, for a number of years, and it is always some western variety that bears heaviest and produces the heaviest crops early. Any opinion contrary to this must grow out of lack of experience with western kinds.

We have secured some rather remarkable results in early bearing with western varieties, which results, we tell you frankly, are of value in only the following ways:

First: They help advertise our business.

Second: They help correct the erroneous impression that it requires a wait of many years before pecan trees begin to bear.

Third: They help one in western territory to arrive at a decision to use only western kinds.

Fourth: They are, in some cases, of value as a varietal sign, in that early bearing is considered to be something of an indication as to the quality of the variety in respect to production.



FIG. 4.—In nursery row, 5 nuts the first year.



FIGS. 5 and 6—Other trees in nursery row, second year after budding

For other purposes, the results are valueless; for another tree of the same variety, even though it did not bear so early and may have been grown by another nurseryman, would, other things being equal, produce as heavy a crop eight or ten years after setting as the early bearing one would produce. In other words, a few nuts on a little tree does not prove that this particular little tree will bear more nuts ten years hence than any other little tree of the same variety.

Here are some of the results we have secured:

Figure 7 shows a little tree in the nursery row. It was budded the year before, but did not get large enough to be dug and sold, and was carried over. The next year it matured 25 large nuts.

We had a similar tree that lacked two or three inches of being waist high to a man of average height that matured 27 nuts weighing one-half pound.

One season we had a tree only 9 1-2 inches from the topmost leaf to the ground, which tree matured a cluster of full sized nuts. A man could place his thumb on the ground and span the nuts with his middle finger. The age of this tree from the planting of the nut from which it grew to the gathering of the nuts from it was 19 months.

Two important newspapers took pictures of this tree, and a great many credible people will testify to this statement. We carefully crossed these nuts with another variety at the proper time and later planted them in our experimental plot where we now have little trees growing from them.

The following results are important in every way as showing annual yields. Figure 8 shows a four-year-old tree that matured 4 pounds of nuts that year. During the following consecutive years the crop increased to 12 pounds, 18 pounds and 30 pounds. (We give only the nearest pounds, omitting

fractions.) It then dropped back to 23 pounds, and it has on it at this writing a crop of about 60 pounds.

This tree has had no special attention, its cultivation being mostly incidental to other crops. It has had two light applications of fertilizer.

Are these among our best records? Yes, but we have many more trees that are doing wonderfully well.

A visitor said: "I am amazed at what I see here, but I go to the dog show and see the dogs act, but when I go home my dog won't do that way. How about that?" Yes, your orchard will do as well as ours and better if you will give it the proper attention, for ours has not received the attention it should have had.

We repeat that three things are necessary: Pecan soil, right varieties, and cultivation.

Your orchard will not do as well as ours if you set the trees in Johnson grass meadow and then manifest your next interest by going back next season to see if they are alive—and we might add, it will do the trees no good to accuse the nurseryman of having sent you a bad lot.

Our trees have not, so far, proved a good means of destroying Johnson grass.

To those who think they will have to wait too long to justify them in setting out trees:

No one waits so long as he who does not start.

You will have to wait whether you set trees or not.



FIG. 7.—4 1-2 ft. tree in nursery row. 25 nuts year after budding

Varieties of Pecans

In the principal address of the occasion, delivered at the National Pecan Growers Association at Albany, Ga., in 1926, by Dr. Hedrick of the Geneva, New York Experiment Station, he said:

"The most important problem confronting the industry for the next fifty years is that of varieties, and the most important problem for the next fifty years following that will be varieties."

We call your attention to our very long list of western varieties.

We are located in the great natural pecan belt and we believe that the pecan will reach its highest state of development in that territory. We firmly believe that this will be done with varieties that originated here, and are, therefore, adapted to the environment. We have always believed this, and with this aim in view, the directing head of our nursery has spent more than twenty-five years in investigative and experimental work, having during that time examined and graded thousands of samples of nuts from the best native trees, out of which our present list has come.

He not only selected the best kinds he could find, but secured buds from them, brought the buds together and propagated them so as to be able to observe the different new varieties in respect to yield, susceptibility or resist-



FIG. 8.—Four year tree that bore four pounds.



NIG. 9.—The two trees in this picture are in our young orchard. The nuts were picked from them by hand without the use of a ladder. The crop from one of them was 10 lbs., and from the other 12 lbs.

ance to diseases, and all other points of advantage or disadvantage, as the case might be. He also sent buds and grafts to different locations and had them grown there in order to obtain information of varied climatic effects upon each of the varieties, and thus be prepared to render valuable advice in the selection of varieties for any given location.

The Evans Specialty Nursery is not simply a nursery in the ordinary meaning of that term. It is more than that. It is a plant breeding place, an experimental place, and a nursery combined.

As a matter of fact, the nursery part of our work grew as a necessity out of our breeding and experiments.

We lay emphasis upon the word **Specialty**. Most of the varieties of fine fruits and nuts that we grow were either originated by us through breeding or collected by us by selection from nature's breeding. They are our own.



FIG. 10.—This tree of the Clark variety is less than two inches in diameter.

Scale of Grading

In order to get a fair idea of the value of a variety of pecan it is necessary to compare it with other varieties; and such comparison implies a standard or scale of grading upon certain well defined points and qualities.

Following is the scale we use in estimating the value of a variety from the growers standpoint:

	Points
Bearing habit (regularity of crop, heaviness of yield).....	50
Appearance (shape, size, color).....	15
Mechanical qualities (cracking, separation).....	15
Turn-out of kernel (proportion of meat to whole weight).....	15
Quality (richness, flavor)	5
TOTAL ,.....	100

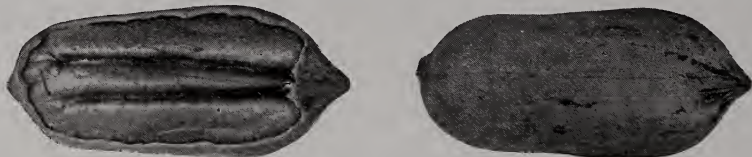
Three cuts of any variety are necessary to a conception of its value. One cut to show the general appearance of the whole nut; a second to show the primary and secondary sutures in the halves of a kernel; and a third, a cross section, showing fullness and plumpness of meat, thinness of shell, and amount of corky packing material surrounding the kernels, and also depth and width of the sutures.

In the following descriptions (E) means eastern variety, and (W) means western variety.

Each cut is the actual size of an average nut of the variety it represents.

The nut photographed was not the largest of its kind, and in nearly every case it was grown on some young tree in our nursery grounds.

Those who set trees of these varieties in ideal locations may expect somewhat larger nuts than are here shown.

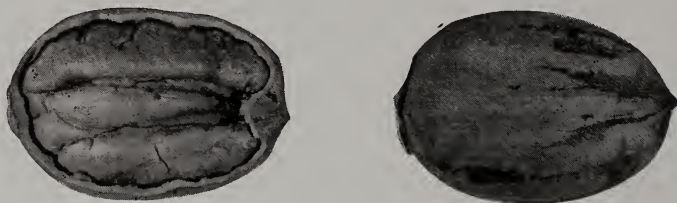


✓ **SCHLEY (E).** The Schley is the "class" of the eastern varieties. It so far surpasses the others in quality as to command a higher price in the market, and is sold under a separate brand name, "Queen."

Nuts not of the largest size, but large enough, running about 50 nuts to the pound. Shape, long conversely enlarged and fattened at base and apex. Shell, thin; kernel full and solid; flavor, rich. Cracks and separates almost perfectly. Percentage of meat, 62.

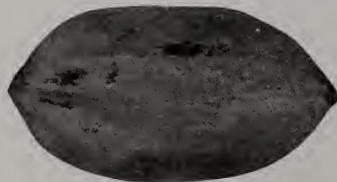
It is not as early a bearer as some others, but is said to overcome shy bearing later on. Subject to fungous attacks to some extent, especially in coastal belt.

The variety has the disadvantage of producing nuts of different sizes and even somewhat different shapes, on the same tree in the same season. The nuts also sprout in the shell in case of much wet weather during the fall.



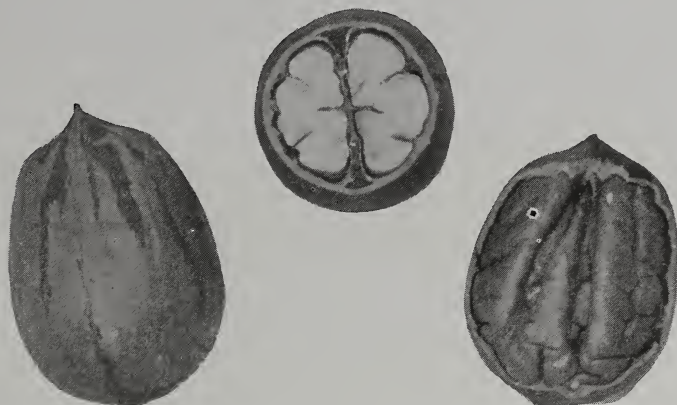
✓ **SUCCESS (E).** A large nut. 10-45 to the pound. Enlarged toward base, and slightly drawn in toward apex. Shell, medium; kernel, full and solid (where the variety does well); cracks and separates well. Percentage of meat, 52-54.

Nuts of this variety are large and handsome in appearance, and the variety is a profitable one to use in locations where it is adapted. However, its range of adaptability seems not to have been clearly defined yet. We have reports from some places that the nuts did not fill well, while from others, reports were most pleasing. The finest samples of the variety we have seen came from the Guadalupe valley about Seguin and Gonzales.



DELMAS (E). A large nut. 42-47 to the pound, of balanced length and thickness, slightly tapering at both ends. Medium shell; cracking and separating, good; 46-50 per cent meat.

It is said by many that this nut would be more generally grown in the coastal belt than any other variety, but for its susceptibility to scab. However, we have seen it growing free from this disease even in Georgia in the hills away from the coastal belt. It is entirely free from scab in the native pecan belt. Trees of the variety are thrifty, but are very late in maturing their fruit.



HALBERT (W). This variety is most remarkable for its early and heavy bearing. However, it is very susceptible to scab, and should not be used in bottom lands east of Dallas, or very far south of there. However its east and south range may be somewhat extended in higher localities where the air drainage is good and there is no obstruction to the winds.

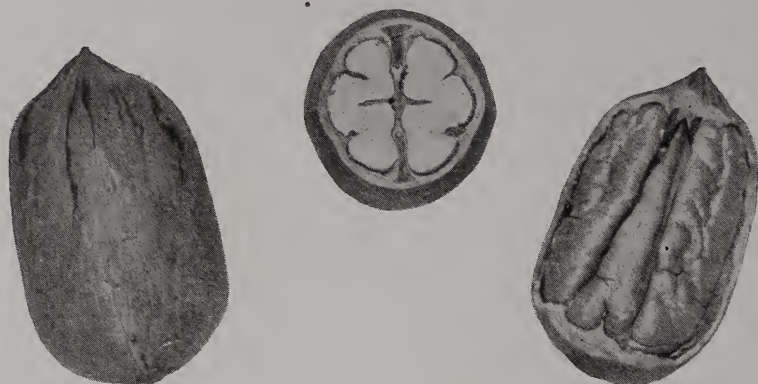
Nuts, as a rule, not large, but of fair size, averaging about 56 to the pound. However, they vary greatly, depending on the fertility of the soil in which the tree grows, the amount of moisture available, and the cultivation the tree receives. Always, though, the nuts are full of meat, no matter what the size. We have seen large Halbert nuts grown under favorable conditions. Shell, thin; kernel, rich and plump, but cracking and separating not perfect. Meat content, 58 to 60 per cent.

Trees of the variety do not grow as large and strong as some others, but we would not be willing to leave the Halbert out of any setting we were making for ourselves provided the location was favorable to it.



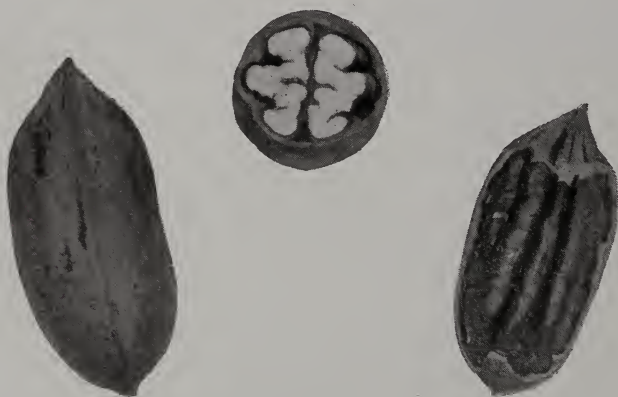
BURKETT (W). A large, round nut, about 45 to the pound, with thin shell and fairly full kernel, though the meat is somewhat powder marked. Cracking and separating qualities high, and the meat content, 54 to 56 per cent, would be higher but for the considerable corky material around the kernel, which, however, separates easily from the meat. The tree is a strong grower, and is highly resistant to scab. We sent scions to Georgia many years ago, and had trees grown there where they are doing very well. The nuts from these trees are not so large as those grown in Texas, and the variety is not well enough adapted to that territory to compete with eastern ones. We mention the fact of their growing there to show that the variety has a wide range of adaptability.

The Burkett is a rather consistent bearer though not a heavy one. The variety originated in very high altitude (for pecans) and it is our opinion that it is a very valuable variety for a large part of the native pecan belt.



SOVEREIGN (W) (Texas Prolific). A medium long nut of good size, running 45-50 to the pound; shell, medium; cracking and separating qualities, fair; kernel, plump and of superior flavor; percentage of meat 52 to 55. This is one of the early bearing varieties but the pistillate blooms, even in the same cluster, do not reach the receptive stage at the same time, and for this or for some other reason, the clusters fail to set a considerable part of their nuts. However, the variety is generally classed as one of the good bearers, and is giving entire satisfaction in many places.

Trees of this variety are willowy in their growth, and do not grow as rapidly as some others.



WESTERN SCHLEY (W). A nut resembling the Schley so much in size and shape as to be easily mistaken for it. However the color of the western nut is a little darker than the eastern one. Shell, thin; cracking and separation, fairly good, though the cross sections show the sutures to run deep; kernel, full and of fair quality; percentage of meat, 58 to 60.

The trees are fairly rapid growers, are thrifty and green, and are little susceptible to scab, if susceptible at all.

In point of bearing it deserves to rank among the good ones, although our test trees here are not as regular in this respect as some of the other heavy bearers. The trees of the variety tend to grow larger branches and fewer of them than the typical heavy-bearing western kinds.

The variety begins to bear early and intermittently produce a bumper crop, but observations since our last catalog seem to indicate that the trees cannot be depended upon for regularity in heavy bearing, although they bear some every year.

Recommended for setting throughout the entire native pecan belt.



✓ **CLARK (W).** Nuts not large but of fair size, running about 55 to the pound. Shell, thin; cracking and separating qualities, good; kernel, rich and plump, entirely filling the shell; proportion of meat, 55 to 58 per cent.

Trees of the variety are extremely willowy in their growth, but are thrifty and grow fairly rapidly; and the variety is one of the very best in point of bearing, though subject to fungous attacks in low altitudes and damp climates.

A peculiarity of this nut is that the kernels cannot be easily taken out in halves by the use of an end-pressure cracker because the shell is too full of meat; but nearly every nut can be made to turn out two perfect halves by using an ordinary double-handle table nut cracker.

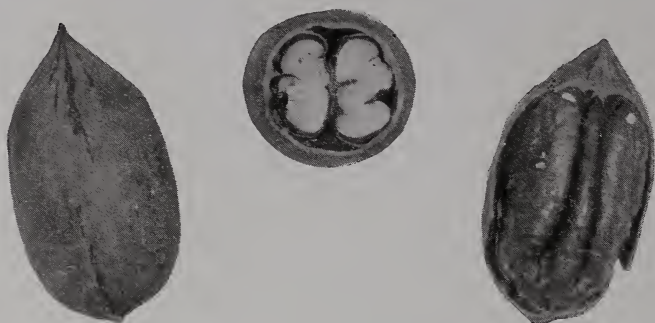
While the nut is not a large one, it is our opinion that it will play an important part in the development of the industry throughout the central and northern part of the pecan belt, because of its excellence and heavy bearing.



✓ **CLINE (W).** Perhaps the largest good pecan and the best very large pecan grown, running 29 to 35 to the pound. A rather long nut, somewhat flattened and pointed at the apex. Shell medium; cracking and separating, fair; kernel plump and full when grown under favorable conditions; proportion of meat, 50 to 53 per cent.

Trees of the variety are perhaps the most pendulous and willowy of all, although rapid and strong growers. In point of early and heavy bearing the variety is one of the best ever introduced.

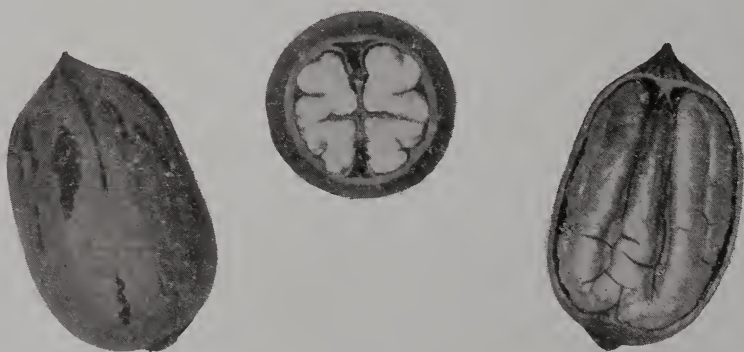
We have had trees grown as far east as Shreveport, where they appear to be free from scab and are otherwise doing well, and we are now ready to recommend the use of the variety in all parts of the native pecan belt except the extreme northern section. The variety has a rather late ripening date and we fear the nuts might not mature before the advent of frost when grown too far north. But to those who want to produce large showy nuts in other parts of the native pecan belt, we do not hesitate to say that the Cline is the one to get.



MILLICAN (W). A perfectly round-bodied oval nut of good size, averaging about 54 to the pound, gently sloping to a point at each end.

We formerly said of this nut that it had the thinnest shell that ever enclosed a kernel, and while we now have to retract that statement to a slight extent on account of two of our new varieties, we still say that it is one of the thinnest shells in existence. Cracking perfect; separation, a little off, because the sutures in the kernels are deep and narrow, and it is necessary to push out some of the corky material with a tooth pick; kernel, full and plump; percentage of meat, 55 to 58.

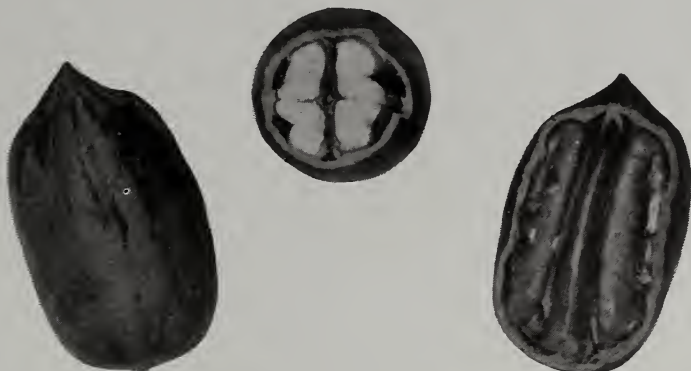
Trees of the variety are rapid growers though their branches are not so numerous or slender as is the case with some other western trees. They are perfectly immune to scab in this territory, and while they do not begin to bear very young, we have tested them long enough to see that they are regular and consistent bearers.



IRON (W). In shape a nut of the type of the Sovereign (Texas Prolific) and of nearly the same size, though possibly a shade smaller.

Few varieties equal it in quality. Shell, very thin; cracking and separation, fine; kernel full, plump, rich and smooth; percentage of meat, 58 to 61.

The tree is a strong healthy, vigorous grower, entirely free from scab in this section. In point of bearing it does not begin early but increases rapidly after it once starts.

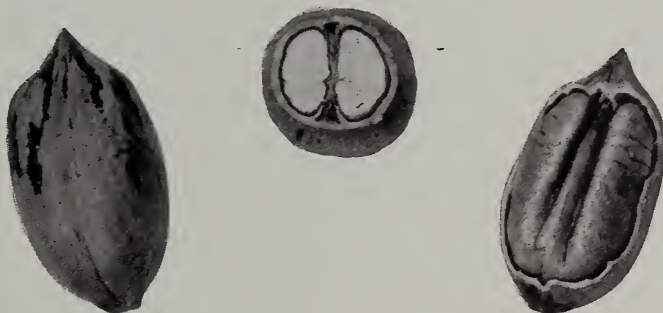


✓ **SIMS (W).** A nut of good size, about 55 to the pound, of the type of the Success, being enlarged at the base and slightly drawn at the apex, though it is somewhat longer in proportion to thickness than is the Success.

Shell, medium to thin; cracking and separation, absolutely perfect; kernel, rich and plump and of fine appearance; percentage of meat, 52 to 54. Trees are very slender of branch and twig, are of moderate growth though perfectly healthy, being free from rosette, and also of scab so far as our experiments have extended.

In point of bearing, the trees do not begin as early as some other western kinds, but they later bear very well indeed.

We look for this nut to prove of special value in the future, when the cracking and packing plants begin to put up packages of finished products instead of selling in the shell. We repeat that no nut can surpass this one in cracking and separation.



✕ **NUGGET (W).** A nut below the average in size, running 75 to 80 to the pound, but of unsurpassed quality in every other respect. Shell, very thin; cracking and separating perfect; kernel, plump and rich, and perfectly smooth; no dust, and very little packing around and between the kernels; percentage of meat, 60 to 63.

Trees of the variety are remarkably healthy, though not of as rapid growth as some others. We have never seen one of them even slightly affected by rosette or dieback in any kind of location.

Our former catalog stated that the variety is very susceptible to scab, but we have found out that it is not so much so as we formerly thought. The mistake arose in this way:

We sent scions of the variety to a scab-infested grove of Halbert trees and had the scions placed on these trees. The owner of the land subsequently reported that the growth from the Nugget scions was also badly affected, almost even to the extent of the Halberts. But the owner had mistaken the identity of the twigs. The Nugget had not been affected while the Halberts were ruined.

We had an unusual amount of rain here one season, and our Halberts were affected for the first time, and the Nugget showed no trace of scab.

The bearing habit of this variety is now established to our satisfaction. It does not begin to bear as early as some other varieties, but it begins early enough, and is one of the best of all in point of production. Our Nugget trees bore heavier crops than the Halbert last year, and there is a good crop on them again this season.

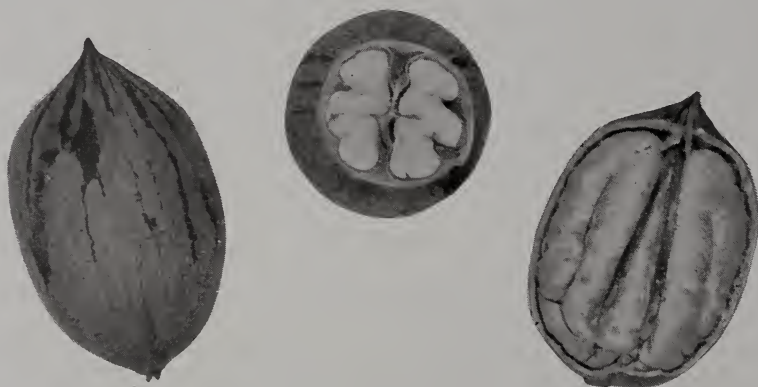
This is the pecan that the biggest buyer in the world pronounces the best pecan he has seen in his fifty years in the business.

(We formerly called the Nugget by another name Simmons, because we acquired the variety from a neighbor and friend of that name. But while we had the variety under experiment the name Simmons was applied to a Florida pecan, and this necessitated a change of name.)



(Somewhat reduced.)

BOGGUS (W). An attractive nut about the size of the Stuart, averaging around 52 to the pound. Light colored shell, beautifully striped when newly gathered; shell, very thin; cracking and separation, fine; kernel, plump and full, though surrounded by rather too much corky packing; percentage of meat, 52 to 55; bearing habit, consistent and good, though not as early as some others; trees moderate but healthy growers, free from rosette, and also from scab as far as our experiments have been conducted. Recommended for the southern and central parts of the native pecan belt, but not for the northern part, as its ripening date is rather late.



WELTY (W). A fine shaped nut, pointed at the apex and rounded at the base. Size, large when grown under favorable conditions, runs about 47 to the pound on an average though select ones run as low as 42 to the pound. Color, brown with dark stripes; shell, medium to thin; cracking and separating, fine; kernel, plump and full; proportion of meat, 58 to 60 per cent.

Trees of this variety are strong and thrifty, and are, perhaps, the most beautiful of all. The branches grow symmetrically, and are always full and round, even to the tips; and the leaves have good shape and color.

We have not tested this variety for resistance to disease on an extensive scale, but we have never seen a tree of it affected by scab, even growing by the side of Schley trees that were affected. We know, therefore, that it is not very susceptible to fungous attacks, to say the least; and we do not hesitate to recommend it for the greater part of the native pecan belt, and even in a limited way for the eastern and southern parts.

In point of bearing it is both early and prolific.

We have now had sufficient experience with this variety to warrant us in recommending it to our customers.



HARBIN (W). (Carried on our records as E-5). A large round nut of the Burkett type, though not quite as much shouldered at the apex as the Burkett.

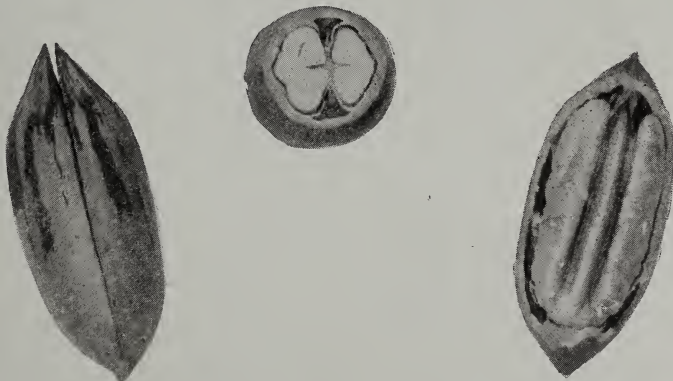
Average about 40 nuts to the pound.

Doubtless the parent of the Burkett tree is also the parent of this one, as both trees grew in the same valley below where the old original tree of the Burkett type stood. We have carried our test tree of this variety on our records as the E-5, which means that we have had under test five varieties of the type, all from the same little valley, all thought to be descended from the same tree; and that this particular tree stands fifth in cross section E.

Shell, rather thick in comparison with the classy nuts we have been describing; cracking, for that reason, might not be considered good, though separation is fair; kernel, always plump and full, though having some secondary sutures and being surrounded by too much corky material; percentage of meat, 43 to 45.

The trees are remarkable for their health and greenness; and in point of bearing the variety outranks all others, even the Halbert by far.

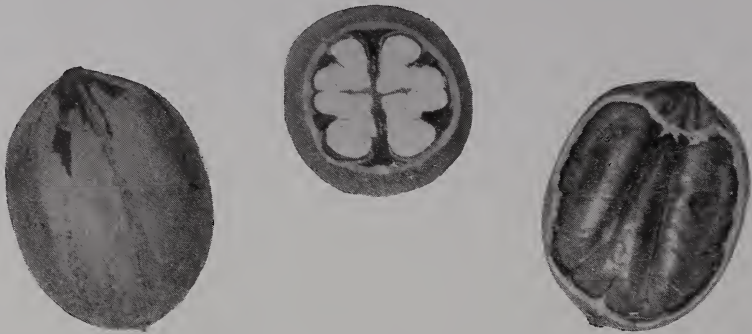
The nuts are large and attractive in appearance; and if they should sell for only 25c per pound, there would be more money in growing them than in any other kind.



LANCET (W). A long, slender nut, pointed at both ends, averaging about 70 to the pound. Shell, medium; cracking and separation, good, and kernel light colored and attractive. Percentage of meat, 50.

Few varieties, if any, bear more heavily or at a younger age than this one, and it appears to be almost immune to attacks of the case-bearer. We would not, of course, assure the public that any variety is wholly immune. All we can say is that we have seen only two nuts of this variety attacked by this pest during two years of observation while all surrounding trees of other varieties were badly infested.

On this account and also on account of its very heavy bearing, we think the variety will prove pleasing to most people.



✓ **EVANS (W).** A nut of the Halbert type, though a little larger, and slightly more shouldered at the apex. Averages 45 to 50 per pound. Smooth, fine-textured, light-brown colored shell very thin; cracking and separation, almost perfect; kernel, full, plump and rich beyond comparison; percentage of meat, 56 to 60; no dust and little corky material.

The kernels of the nuts come out in halves, are as yellow as new gold, and are the most attractive of all pecan meats. Trees of the variety are the rankest growers we have seen, and we think this is one reason why they are late in beginning to bear. Our five-year trees have their first scant crop on them this year, though they are for the first time full of fruit buds, giving some hope of better things next season.

If we only knew the variety to be a good producer, we would urge everybody to buy it. It originated in the lower reaches of the Colorado River, where susceptible varieties cannot grow because of scab; and we think, for this reason, that it will thrive anywhere in the native belt, and even, perhaps, in the east.

Once its bearing is established, the only drawback to the variety would be a rather late ripening date. As it is, we recommend its purchase in only trial quantities.

The above is what we formerly said about the Evans variety. We add that the trees referred to then as beginning to bear have continued to increase their crops to some extent, and that the variety is more promising now than heretofore. Some of our trees have satisfactory crops on them, and their present appearance indicates that they will finally do what we hoped they would. Still we are not ready to assure the public in respect to this point.

✗ **GOLDEN (W).** We shall not continue to catalog the Golden pecan, though we have many fine trees of the variety. Its extreme shyness in bearing up to the present time has caused us to lose faith in it, temporarily at least. We shall continue to carry our test trees in the orchard in order to get further information about this point, and should they finally turn out to bear well, we will announce the fact to the public.

We are extremely sorry that the Golden does not bear young and heavily, for it comes nearer to being a perfect nut than anything else ever discovered.

If the variety finally proves to be without value in point of bearing, we shall request those who have bought trees of it from us to send in and get other trees in their stead.

In addition to the varieties described in the preceding pages we have a number of new ones that surpass all of the known kinds in thinness of shell and percentage of meat, but they have not yet been tested to find out their bearing habits, and trees of these varieties are not yet available.

We shall offer the trees to the public as soon as they shall have shown themselves to be of value in this respect.

How Pecan Trees Should Be Dug

We have always contended that it was injurious to a pecan tree to cut the tap-root in digging.

Many offer the following argument in favor of cutting the tap-root: "When the tap-root of a pecan tree has been cut before setting, it puts out from three to five tap-roots instead of one; and from three to five is better than one."

We answer that we would be pleased to swap them three-to-five nickels for a dollar.

In bulletin No. 81, *The Pecan in Texas*, edited by Mr. J. H. Burkett, and published by the Texas Department of Agriculture, Mr. Burkett makes some comparisons between tap-rooted pecan trees and others.

After remarking upon the importance of the problem, and stating that he had set out a number of Texas grown lateral-rooted trees, Florida grown semi-lateral-rooted trees, and West Texas grown, tap-rooted trees, he goes on to say:

"The first year the lateral-rooted trees made the best growth and the tap-rooted trees very little. The second year the tap-rooted trees did as well as the lateral-rooted trees. The third year the tap-rooted trees outgrew the lateral-rooted trees very decidedly. The behavior of the semi-lateral-rooted trees was intermediate between the extreme lateral-rooted and the tap-rooted trees.

'In the winter of 1924-'25, three years after the trees had been planted, two average specimens each of the three types of trees were photographed as they stood and then dug and the root system photographed and notes taken on their development since the trees were planted.' (Mr. Burkett here illustrates these trees by photographs.) He continues, "It will be noted that the tap-rooted trees have developed a moderate number of new roots, which are large and reach far, while the lateral-rooted trees retain their former dense clump of small roots, none of which reach far and all of which compete with each other. This difference seems to account for the superior growth of the tap-rooted trees in the third year."



FIG. 11.—This picture shows two of our trees pruned (top and roots) ready for transplanting in post holes. The trees are an average—neither the best nor the worst. Note that they are dug with whole tap-roots.

Three-fourths of our trees are dug with the tap root entire, and all of them are dug with the tap-root practically whole. It is much less expensive to cut them instead of digging them out, but we spare no expense in our efforts to make the industry a success.

If the objection be raised that it would be very expensive to set out our trees with their long tap roots, we answer that they ought to be set out that way whether it is more expensive or not. It is little short of a sacrilege to injure a tree that is being set to last a hundred years or more. But as a matter of fact it does not cost more to set out a tap-rooted tree with short



FIG. 12.—This row of trees was set out in post holes near our office about the middle of February, one year, and the picture was taken November 1, next year. The trees were set out to show customers our range of prices, from one dollar to three dollars, without walking all over the nursery.



lateral roots than it does to set out a short tap-rooted tree with long lateral roots. It really costs less, as the former can be set in a small, deep hole, dug with a post hole auger, whereas the latter would have to be set in a large and expensive hole, dug with pick and shovel.

A certain man purchased 200 pecan trees from another nursery and also 200 from us at the same time. He then set the trees out, following carefully the directions given in connection with the two lots of trees respectively.

The method of the other nursery was setting in big square holes, using only good top soil around the roots of the trees.

Our method was setting in post holes, putting the soil back just like it came out.

He later wrote us that the ground was hard at the time the trees were set out, and that the holes by the other method cost him 50c each to dig, and the setting of the trees 20c each, making a total cost of 70c.

The post holes cost him 7c each, the setting 2c, making a total of 9c.

Still later, he

FIG. 13.—This is a close-up view of the top of the end-tree in the row shown in Fig. 12 (above) on this page.

This tree has nearly two pounds of nuts on it, twenty months after setting. It had a few nuts on it the same year it was set out.

wrote us that a bigger percentage of the trees lived in the post holes than in the large holes.

A tap-root can be dug whole; lateral roots must be cut; and with their cutting goes the loss of all hair roots through the extreme tender tips of which all water and nutrients from the soil are taken in. It is plain, therefore, that a transplanted tree cannot take in soil moisture until it has grown new hair roots from the cut ends of the lateral roots; and these new hair roots will put out just as quickly from the end of a short-cut lateral root as they would from a long-cut one.

There appears to be no advantage in long-cut lateral roots, while there are some disadvantages. First, long roots require a big hole to set the tree in, while short roots can be set in a small, round, though deep hole. Second, we have come to the conclusion that it is actually better to set out trees in these small, deep holes.

The custom of setting trees in large holes and filling in around them with only good top soil causes a break in capillary attraction between the subsoil of one character and the filled-in soil of another character. We have examined whole settings where the filled-in soil around the trees was perfectly dry while the surrounding subsoil was moderately moist. There had been no running together of the two soils so as to form a good union. In many cases, on the other hand, there were actually cracks between the filled-in soil and that surrounding it, thus completely cutting off all moisture that might have reached the roots of the trees by capillary attraction.

How to Set out Pecan Trees

The process of setting out pecan trees heretofore employed is as follows: Holes 2 to 2 1-2 feet wide, 4 to 4 1-2 feet long and 3 feet deep. If greater depth than three feet is required to accommodate the tap-root, add the necessary depth by use of a post hole digger in the middle of the large hole. Take the trees to the field in the original package, taking out only one at a time as needed, and keeping the others well covered so the roots will not dry out.

Let one man get in the hole with the tree while another shovels in dirt around it, using only good top-soil. The man in the hole should keep the lateral roots straightened out in their natural positions, and should keep the dirt well packed in around the roots. Continue until all roots are well covered and the hole is nearly full of dirt. Pour in two or three buckets of water and, after the water has all been taken up, finish filling the hole with dry dirt.

It is usually considered better to set trees an inch or two deeper than they stood in the nursery row.

New Way

We recommend the setting of whole tap-rooted trees with short cut lateral roots in post holes amply deep to accommodate the whole root, putting the dirt back as nearly as possible just like it came out, if it is good dirt, and not too dry and cloddy at the time.

The dirt should be tamped very carefully and gently (so as not to skin the roots) all the way from the bottom on up nearly to the top. Just before the hole is full, pour in a bucket of water in order to both moisten the dirt around the roots and settle it more compactly. Then finish filling the hole with dry dirt.

Setting a tree in this way will not only help it to live, it will establish it at once in the kind of soil it must live in the remainder of its life instead of giving it a more pleasing start, possibly, while it overfills the loose dirt with hair roots and then suffers because the roots have not entered the harder dirt around.

Your Choice of Ways

If you do not like our way of digging and setting pecan trees, we will dig them any way you want them dug—whole tap root or cut tap root—long

lateral roots or short ones. You can then set them out in any way you like but we have now had sufficient experience to be able to tell you that the post hole method has been more successful with us and that it costs less money.

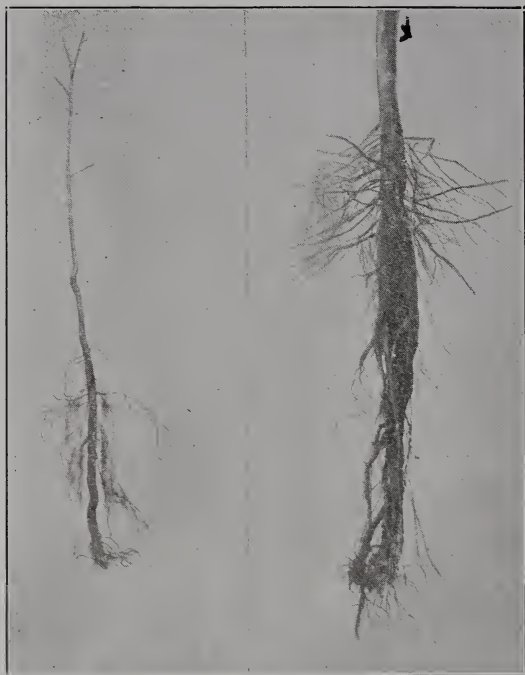


FIG. 14.—In order to show what roots do when trees with long tap roots are set in post holes, we dug up two trees that had been set out that way.

The tree on the right was set out in February of one year and was dug up in November of the next year.

Note the mass of lateral roots that put out from the ends of the cut ones. Many of them are so large as to make it difficult to tell where the roots were originally cut, and we followed some of them 6 feet without coming to the ends of them.

The tree on the left was set out in March and was dug up Nov. 1st, the same year.

Note the mass of fibrous roots that put out from the ends of those that were cut back for transplanting, particularly those from the cluster of lateral roots near the end of the tap-root—and they would not have been there except for deep digging of the tap-root.

Time For Setting Trees

The season for setting out trees extends from the first of December to the middle of March. Any time between these dates is good, but we have a preference for the early settings. In the first place, the customer gets a bigger range of choice at the nursery by ordering early, and then, too, the dirt has time to settle around the roots of the transplanted tree before it starts to grow in the spring.

Still trees can sometimes be set out successfully even after the middle of March, although we do not recommend a later date. In cleaning up our heeling yard this year we found about a dozen trees that had been overlooked, and took them up and set them in post holes about the middle of April. Every one of them lived notwithstanding the fact that they had some green foliage on them at the time. We would add, however, that we had an abundance of rain this spring, and such results might not be obtained under more unfavorable conditions.

We do not spray our trees with chemicals to kill the leaves so as to be first in the market.

Every year we find the market flooded with pecan trees before ours are ready. Many of these trees come from as far east as Florida, and nearly all of them come from far southern locations where cold weather sets in much later than it does with us. We know, therefore, that these trees must have had their leaves killed by spraying, which is a devitalizing practice.

Fertilizing Newly Set Trees

Fertilization the first year should be made by the application of a half-bushel or more of well-rotted stable manure placed in a shallow circular

trench around the crown of the tree, but not in contact with the tree or any of its roots. The inside edge of this circular trench should be about a foot from the tree and the trench should be sufficiently deep and wide to accommodate this amount of manure well mixed with earth and still permit its covering with two or three inches of soil.

The fertility from this manure will reach down around the roots of the tree and will be sufficient for its needs the first year.

Trimming and Heading of Our Nursery Trees

Unless we are instructed to the contrary, we send out all trees trimmed both root and branch, ready for transplanting. Most people prefer to take advantage of our knowledge of trimming and to receive trees ready for transplanting.

Trimmed trees can be packed in smaller packages than untrimmed ones, transportation charges will be less, and there will also be less danger of injury in transit.

Number of Trees to Set to the Acre

There is a strong tendency in the case of beginners to set trees too close together, some even advocating 30 feet apart each way, or 48 trees to each acre of ground.

There is an even stronger tendency among experienced growers to set them farther and farther apart, many advocating 100 feet apart each way in rich valley land.

We have never seen any one who set trees closer than 60 feet apart in orchard formation who was not sorry of it within a very few years after.

In sandy uplands where the trees will not grow so large, 60 feet each way will do, but the roots of trees this distance apart will meet in ten years or less, and there must always be space between the tops to admit plenty of sunlight and to allow free air movement to prevent fungous diseases.

In rich bottom lands the trees should be not less than 75 feet apart, and 90 feet would be better.

In case of trees around the home, in the yard, where there is no com-



FIG. 15.—This lateral root was cut at 12 feet from the main tap root. It was nearly as large at the point of cutting as at the place of starting.

This illustration shows why it is unwise to set too many trees to the acre. It also shows that fertilizer should be applied over a large area around the tree.

petition on the sides and where they can be carefully cultivated and watered they may be set closer together.

Obviously, it would be to our interest to advise closer setting in order to sell more trees, but we are offering the above advice in the interest of the grower.

We recommend the "square" system, which is almost universally used in the arrangement of an orchard. Following are the approximate number of trees per acre under the square system:

60 feet apart, 12 trees per acre.

70 feet apart, 9 trees per acre.

80 feet apart, 7 trees per acre.

90 feet apart, 5 trees per acre.

100 feet apart, 4 trees per acre.



FIG. 16 shows the staminate (male) bloom of the pecan, which is in the form of catkins. Each catkin is composed of hundreds of little pods like English peas, each one of which pops open and sheds small grains of yellow dust, called pollen.

Not all varieties shed their pollen at the same time; and it is thought best to extend the period of shedding by having more than one variety.



FIG. 17 (right) (enlarged) shows the pistillate (female) bloom of the pecan with the form of a little nut just below.

These pistillate blooms were in a highly receptive state when this picture was taken.

Each bloom that receives a grain of pollen at this time will set a nut. Each one that fails to receive a grain will fail to set a nut.

Number of Varieties to Use in Orchard

The beginner is inclined to set too many varieties. We have recently visited a number of older groves that contain the entire list described in obtainable catalogues, and always the owner was sorry that his trees were not all of some four to six kinds—if he could only have known what ones to choose when he bought them.

At this time there is less excuse for using so many kinds, for there is more information about varieties.

But while it is not wise to use too many kinds, we think it is best to use as many as three or four, at least, in an orchard of any size in order to secure more perfect pollination. The varietal rows should be arranged east and west across the direction of prevailing winds.

Our advice is to set the bulk of your orchard to standard varieties adapted to the location where they are to grow—eastern varieties in the east and western varieties in the west—using a limited portion of your land for promising new kinds.

(Figures 16 and 17 explain why it is better to have more than one variety.)

Where to Buy Trees

The answer to this problem depends upon where you live. If you live in the great native pecan belt where the atmosphere is dry, consider well the climate of Florida, Georgia, Louisiana, and East Texas before buying there. It is the climatic effects and not the names of states or locations, that count. We think a tree of a given variety would do as well fifty feet beyond the Texas-Louisiana line as another like tree would do fifty feet this side of the line in Texas, as trees know nothing of geographical lines. They are, however, greatly affected by differences in climate, and it is this the customer should pay attention to.

If you live in East Texas or any place east of there, it will be all right to buy trees in East Texas or any place east of there.

There are two reasons for these statements; namely, the constitutional adaptation of trees to environment, and adaptation of varical characteristics to environment; and the latter is by far the more important, as it has a bearing not only on the vigor of the tree, but also upon its bearing habit, and other points that go to make its value. To illustrate: As between a Stuart tree grown in Georgia from a seed nut that was also raised there, and another Stuart tree grown here from a seed nut that was raised in the west, we would have some preference for the latter.

As between a Stuart tree grown in Georgia from a seed nut that was also raised there, and a Clark tree grown here from a seed nut that was raised in the west, we would have a most decided preference—so decided, in fact, that we could not be induced to use the former tree.

We would not even be willing to use a Stuart tree grown here on stock from western seed, because the Stuart top would carry the varietal characteristics with it, including lack of adaptability to environment.

The eastern nurseries might solve the root problem by the use of western seed; the other problem is not susceptible of solution.

So, if you should not buy eastern grown trees, you should not, with still more reason, buy eastern varieties of trees.

We mean no disparagement of any other nursery. We think that any nurseryman in the eastern belt would advise against the setting of West Texas varieties there, except in a limited way.

He certainly would be right in doing so.

Some nurseries in the far South, where cold weather comes late, have been in the habit of applying poisonous sprays to their trees in order to defoliate them and get them on the market early.

Personally we would not want trees that had been treated that way.

Our Pecan Seed

Manifold effect of stock on scion is a mooted question. No one, however, questions the effect of stock on the vigor and growth of the scion.

It is our opinion that other effects are modifications growing directly out of this major effect.

Trees that have grown for ages, generation to generation, in a dry climate, have modified themselves to fit conditions there. They have more root and less top, for instance.

This modification did not come about in a day; neither is it lost in a generation.

We have found that pecans from high, dry parts of West Texas produce wonderfully tap-rooted trees, with a fair number of lateral roots coming out all along them from top to bottom, so as to draw moisture from deeper soil and a greater volume of soil than they could do if they were massed together near the surface, where they would not only fail to draw moisture from so great a depth, but would actually compete with each other for what moisture might be near the surface.

This modification can but favorably affect the vigor of the trees in the native pecan belt of Texas and Oklahoma, where a constant supply of moisture is the most important consideration, and, through vigor, also affect size of nuts, heaviness of yield, percentage of meat, and richness and flavor of kernel.

We get all of our pecan seed from West Texas.

Some nurseries make a point of getting their seed pecans from swampy territory because trees grown from seed nuts gathered from trees that have lived from generation to generation under such conditions have a tendency to produce an abundance of lateral roots near the surface of the ground.

In our opinion trees that have developed such roots at the expense of an ample tap-root are not best for any section that is subject to dry weather.

Cultivation, Intercropping, Fertilizing

Probably ninety per cent of the pecan orchards we have seen have been neglected to some extent—most of them sadly neglected. Perhaps more pecan trees die from neglect than from all other causes combined.

When you set out pecan trees, make up your mind at the time to give them all the attention they need—it will pay you. That pecan trees produce a few nuts under conditions of neglect is no proof that they will not respond to cultivation and fertilization. In fact there is no other tree that responds more readily than the pecan.

All the pecan orchards that have grown to be profitable are those that have been well cultivated and have received sufficient fertilizer to meet the deficiencies of the soil.

It is all right—even desirable—to grow crops in the space between the pecan rows, provided the crops are not rank growing ones, like corn, or thick growing hay crops, like sorghum and Sudan, any one of which would rob the young trees of moisture.

A space 4 1-2 feet wide should be left on each side of the young trees, which space should be kept well cultivated at all times. This space should be widened from year to year until the whole area is finally appropriated to the trees.

Not much will be lost to the crop during the early life of the trees under this arrangement, as the crop rows next to the open space of the tree rows will produce much more than they would have done had the space not been there.

Directions for fertilizing pecan trees the first year will be found in another place. The second year an application of barn yard manure to most soils would be of great benefit, and on soils deficient in phosphorus, the addition of phosphoric acid would be profitable. Each succeeding year the amount of fertilizer should be increased, being applied in ever widening circles.

The growing of money crops between the trees should not be pursued to the exclusion of green manure crops, preferably suitable legumes, which are necessary to maintain a high humus content in the soil.



FIG. 19.—Wintercheek Peach

I, Roy Jernigan, of Jernigan Photo Service, Fort Worth, Texas, certify that in the month of November I took the picture from which the above cut was made, and that at the time not only this particular tree but many others of the same variety were laden with the most beautiful peaches I ever beheld.

(Signed) ROY JERNIGAN.

The Evans Specialty Nursery has the most wonderful collection of peaches in the world, perhaps. Also some fifty varieties of grapes, and many foreign fruits.

Write for information and separate catalog.

